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ABSTRACT

Erik Erikson concluded that differences in the play constructions of young children are largely determined by psychosexual differences in the subjects and not by cultural influence. He suggested that additional observation of younger and older subjects could determine whether the differences were true for all ages or whether they were restricted to preadolescent subjects. In the present study, sex differences in play constructions of 30 preadolescents, 30 6-year-olds, and 30 16- and 17-year-olds were observed. Each child was asked to build an exciting scene and to relate a story about it. Differences in construction of males and females were measured using many of the same variables which Erikson used when he drew the parallels between the nature of the constructions and the morphology and functions of sex organs. When males and females were compared across all age levels, males used more blocks and included more wall protrusions, while females used more furniture in their constructions. When age groups were compared, the 6-year-old group used more cars and furniture than the other age groups. While these findings offer some support for a psychosexual interpretation, they could also be interpreted as supporting a social learning hypothesis. (Author/DB)

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# Sex Differences in the Play Behavior of Three Age Groups

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Abstract

In 1939-1941, Erik Erikson observed play constructions of preadolescents and concluded that differences in the constructions were largely determined by psychosexual differences in the subjects and not by cultural influence. He suggested that additional observation of younger and older subjects could determine whether the differences he observed were true for all ages or whether they were restricted to preadolescent subjects. The present study offers a recent observation of male-female differences in play constructions of 30 preadolescents, 30 6-year-olds, and 30 16-and-17-year olds. Each child was asked to build an exciting scene and to relate a story about it. Differences in construction of males and females were measured using many of the same variables which Erikson used when he drew the parallels between the nature of the constructions and the morphology and function of sex organs. When males and females were compared across all age levels, males used more blocks and included more wall protrusions, while femals used more furniture in their constructions. When age groups were compared, the 6-year-old group used more cars and furniture than the other age groups. While these findings offer some support for a psychosexual interpretation, they could also be interpreted to support a social learning hypothesis.

Sex Differences in the Play Behavior

of Three Age Groups

Play has come to be viewed clinically as a valuable tool for revealing life events of individuals. In 1940, Erik Erikson reported that children in therapeutic situations reveal relevant life themes in their play. In two exploratory studies, he observed meaningful configurations in play constructions of college students and of psychotic inmates in a state hospital (Erikson, 1951). Erikson is especially known for his work in 1939-1941 with children's spatial play behavior under the Child Guidance Study of the Institute of Child Welfare at the University of California at Berkeley. He observed that the most significant sex differences in preadolescents occurred in their arrangement of certain toys in space. He concluded that characteristic features of boys' constructions were height, collapse, motion, channelization of motion, and arrest of motion (Erikson, 1951). Characteristic features of girls' constructions were static house interiors, which were surrounded either by a simple wall or by no wall, were blocked by a door, or were intruded upon from the outside by a boy or an animal. Erikson states that his subjects' constructions did not merely reflect the sex roles defined for them by society, rather he states that "anatomy is destiny . . . It determines not only the range and configuration of physiological functioning and its limitation but also to an extent, personality configurations. The basic modalities . . . of commitment and involvement naturally reflect the ground plan of the body" (Erikson, 1951, p. 285). Therefore, "the spatial phenomena observed . . . (in children's play) . . . would express principles of arranging space which correspond to the male and female principles in body construction (Erikson, 1951, p. 273): "in males, external organs, erectible and intrusive in character, serving highly mobile sperm cells; internal

organs in females, with vestibular access, leading to statically expectant ova" (Erikson, 1951, p. 690). He concluded that play constructions of pre-adolescents are determined largely by their knowledge of sexual morphology and function and that only data from younger and older subjects would determine whether this was only characteristic of sexually maturing preadolescents or whether it was true of all age groups. To generalize these data to other age groups would imply that differences in life themes of the sexes are biologically determined and that men and women "live in a time space of a different quality", or experience the world from sexually defined boundaries (Erikson, 1951, p. 690).

Data from other studies of male/female play behavior are not conclusive. A number of studies observing toy preferences in children just over one year suggest that there are no sex differences in the use of toys, while others (Bronson, 1971; Goldberg and Lewis, 1969) suggest that males and females do choose somewhat different toys at this early age but that the toy attributes responsible for the choice are obscure. Other studies (Kaminski, 1973; Jacklin, MacCoby and Dick, 1973) found that the most manipulable toys were most attractive to both sexes and that there were no sex differences in the use of toys. Kate Frank (1946) attempted to demonstrate psychosexual differences (by measuring male and female preferences for sex symbols) in adults, but she observed no significant sex differences.

Cramer and Hogan (1975) replicated Erikson's study with a group of 45 (22 girls; 23 boys) younger upper middle class children (c a. 3-7 to 6-3; $\bar{x}$ = 5-6) and a group of 47 (22 girls; 25 boys) older children (9-8 to 12-10; $\bar{x}$ = 11-5). This study also examined differences between age and sex and the development of verbal and spatial fantasies. Results showed use of blocks to construct sidewalks, towers, and buildings was restricted to boys but that

significance occurred as commonly between older and younger subject as between the sexes. For example, configurations which involved erecting structures in a vertical plane occurred more frequently among older boys than girls ($t(44) = 5.66$; $p < .001$), and more frequently among older than younger boys ($t(46) = 5.06$, $p < .001$).

Number of blocks used was a significant variable between older boys and girls and vehicles used was significant between both age groups. Furniture was significantly chosen by girls across age groups but significantly more was used by younger girls than older girls. Cramer and Hogan conclude that their data confirms Erikson's findings and state that "boys and girls used blocks to construct spatial configurations that reflect differences in sexual anatomy (Cramer and Hogan, 1975, p. 152).

The purpose of this study is to produce comparative data from play constructions of males and females in three age groups: 6-year-olds, 11-12-13-year-olds, and 16-17 year olds. These groups provide preadolescent subjects of the same ages as Erikson's subjects, as well as younger and older subjects of different developmental periods. The twenty variables selected for comparison were largely based on outstanding variables cited by Erikson (1951). The hypothesis to be tested was that there would be no significant sex differences in play constructions of a 6-year-old group, a 11-12-13-year-old group, or a 16-17-year-old group.

The Sample

The 6-year-old group was made up of 15 male and 15 female subjects ranging in age from 6.1 to 7.2 years. After obtaining written consent from the parents, the subjects were selected at random by a name drawing procedure from 75 children in a kindergarten and in two first grades of an Atlanta elementary

school. The 11-12-13-year-old group was made up of 15 males and 15 females selected from approximately 150 children in the sixth, seventh and eighth grades of a middle school in Atlanta. The 16-17-year-old group was made up of fifteen males and fifteen females selected from approximately 150 children in the tenth, eleventh and twlefth grades of an Atlanta high school. The ages within each group were approximately evenly distributed and the range of incomes represented was upper lower to upper middle.

Materials

In addition to one hundred wooden blocks of varying size and shapes, eight pieces of plastic dollhouse furniture, a six member family of small, clothed, rubber dolls, a series of six slightly larger wooden, uniformed men (policeman, astronaut, workmen), a group of twleve plast soldiers, ten small plastic animals (representing domestic and wild types) and four cars were made available for the constructions. The materials were sorted in groups on a 3 x 6 foot table, and a chair was provided for the subject. Each construction was photographed or sketched at completion.

Procedure

Subjects were escorted by a female experimenter to a room where the constructions were to be built. The play materials were laid out on the back edge of a table with the exception of half the blocks, which were easily available in a large box beside the table. The instructions given to each child were taken from Erikson (1951). The experimenter instructed each subject to build an exciting story like one he might see on television or at the movies, to use any materials he would like, and to tell the experimenter a story about what he had built.

The experimenter was seated, occupied with writing, ten to twleve feet away from the subject. When the subject acknowledged completion, the

experimenter directed him to tell her about his construction and recorded the story verbatim. After each subject left, the experimenter photographed or sketched each production and the following data was recorded:

(Age of Subject)

(Sex of Subject)

1. Number of blocks used
2. Number of people used
3. Number of animals used
4. Number of simply enclosed spaces, not in conjunction with more elaborate structures.
5. Number of static figures used in the construction
6. Number of intrusions by an outsider into an enclosure(s)
7. Number of figures inside the enclosure(s)
8. Number of furniture pieces used
9. Presence of a wall more elaborate (thicker, higher) than walls of simple enclosures
10. Number of structures protruding above an enclosure (chimney or decorative protrusion)
11. Presence of an elaborate doorway (emphasized in any way other than space between blocks)
12. Presence of a low wall (one block high, as in a simple enclosure)
13. Number of collapses of constructions
14. Number of cars used
15. Number of accidents (car accidents or other accidents in which people or animals are hurt, but not killed)
16. Number of tragedies (someone is killed)

17. Number of channeled objects/people (direction of motion determined by physical boundaries, such as a bridge, tunnel or street)
18. Number of channeled objects/people arrested (motion stopped by outside force, as policeman, red light)
19. Height of construction (tallest point)
20. Activity or motion present in stories told about constructions (rated on 1-5 scale)

Scoring was done by counting the number of times each variable occurred in a construction or during the story (variables 1-18). Height of the construction was measured upon completion (19) and activity level was obtained by independent raters.

To estimate the accuracy with which the play configurations could be classified, two judges, who were unfamiliar with the study, were asked to rate the stories independently. A rating scale of 1-5 was devised to allow the judges a descriptive continuum along which they could place each story in regard to the amount of motion present in the story (1 = low; 5 = high). Inter-rater reliability was established in a pre-experiment trial run of experimenter constructed stories at the 88% level.

## Results

The findings were based on play constructions of 90 subjects, divided into three age groups. In order to measure differences in males and female in their play space, a multivariate analysis of variance was perfromed on the twenty variables measured.

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Insert Table 1. about here

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Main effects for age level were found for the number of furniture pieces used and for the number of cars used. Examination of the means of these variables for each age group shows that the significant difference for furniture pieces used was due to the fact that the 6-year-old group = 3.58; for the 11-12-13-year-old group = 1.93; and for the 1-17-year-old-group = 1.50) and for the number of cars used, that the 6-year-old group used more cars (mean for 6-year-old group = 1.58; for the 11-12-13-year-old group = 0.57; and for the 16-17-year-old group = 0.57).

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Insert Table 2. about here

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The significant main effects for sex were: numbers of blocks used ($F = 9.98$, $df = 1,84$) $p < .002$; number of furniture pieces used ($F = 6.83$, $df = 1,84$) $p < .011$; and number of wall protrusions included ($F = 7.78$, $df = 1,84$) $p < .007$). Examination of the means for these variables shows boys using more blocks and including more wall protrusions, while girls used more furniture

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Insert Table 3. about here

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## Discussion

Significant sex differences were observed in the case of three variables when the constructions of all age levels were observed collectively. Significant differences were seen in the following variables: Males used more blocks and included more wall protrusions in their constructions than females, and females used more furniture in their constructions than males.

The use of more furniture by females may be explained by the socializing force of our culture, where growing girls are encouraged to "play house". It is not easily explained by Erikson's psychosexual theory that female awareness of an "inner space" (Erikson, 1964) influences her to build more enclosures. Note that there were no significant differences in number of enclosed spaces built by males and females. Similarly, the use of more blocks and more wall protrusions by males offers little support for Erikson's psychosexual theory, where male play constructions, as well as male sexual morphology, are characterized by height, downfall and channelized or arrested motion (Erikson, 1951). Note that there were no significant differences in height, number of collapses, or in the number of channeled objects/people or arrested objects/people in male and female constructions.

A second comparison was made in the analysis of the data, that of age groups. Six-year-olds used more furniture pieces and more cars that the 11-12-13 or the 16-17-year-old groups. These results suggest that there are differences in developmental periods in preference for certain toys, i.e. that younger children prefer toys which represent motion and more furniture in their constructions. It is not surprising that the 6-year-old group would enjoy the familiarity of more objects of their immediate environments than the older age groups and that cars especially are powerful objects of fascination for small children.

These age difference as well as sex difference results are consistent with Cramer and Hogan's findings (1975). The results of Cramer's and Hogan's study and this study may be interpreted in two contrasting ways. Cramer and Hogan choose to interpret their data to support Erikson's original work. This point of view would suggest that innate biological mechanisms create the difference in play constructions and stories.

The results of these studies can also be interpreted through a social learning hypothesis. These authors believe that a social learning interpretation allows for a logical explanation of the differences found at each age level which help create the sex differences found in the overall data analysis. The authors think that social expectations are sex oriented in today's society, and this factor further explains the differences they obtained. Specifically, if constructions vary from age to age as well as from sex to sex that the etiology of effect is an interaction between heredity and environment, and not an "heredity" or "biological" function alone.

While this study does not attempt to discount Erikson's pioneering work, it does seek to offer data to show that age as well as sex is a significant factor in play constructions. If this assumption is valid, then the hypothesis of biological representations of genital structures appears to be, at best, only part of the developmental picture.

Future research may wish to examine possible sex of experimenter effects (Erikson's was male; Cramer and Hogan's study used females); the effect of intelligence; the effect of socio-economic status; the effect of geographic area; the education of parents; the effect of urban/rural home location. Each of these factors may be influential in obtaining a clearer idea of the additional factors which led to Erikson's, Cramer and Hogan's, and these results.

In conclusion, these findings offer only partial support for a psychosexual interpretation of sex differences in play constructions even where significant sex differences were observed.

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Table 1.

Univarient Comparison of Age/Variable Interactions

With Which Play Materials Used

| | | | Younger | | Mid | | Older | |
|---|---|---|---|---|---|---|---|---|
| | | | Male | Female | Male | Female | Male | Female |
| Number of blocks | (1) | M | 19.9 | 16.6 | 21.1 | 13.8 | 18.0 | 10.4 |
| | | SD | 9.3 | 10.0 | 10.2 | 7.1 | 10.9 | 6.3 |
| Number of people | (2) | M | 2.9 | 4.4 | 6.3 | 3.3 | 5.3 | 4.8 |
| | | SD | 4.3 | 3.3 | 4.9 | 1.9 | 6.2 | 5.5 |
| Number of animals | (3) | M | 1.8 | 5.5 | 2.5 | .9 | .5 | 1.8 |
| | | SD | | | | | | |
| Number of enclosed spaces | (4) | M | 1.0 | 1.2 | .7 | 1.1 | .9 | 1.0 |
| | | SD | .9 | .6 | .5 | 1.2 | .7 | .7 |
| Number of static figures | (5) | M | 3.3 | 4.0 | 2.7 | 1.6 | 3.5 | 2.1 |
| | | SD | 5.2 | 4.6 | 3.5 | 2.0 | 5.9 | 2.4 |
| Number of intrusions | (6) | M | .1 | .1 | .3 | .2 | .3 | .3 |
| | | SD | .3 | .4 | 1.0 | .6 | .7 | .7 |
| Number of figures inside | (7) | M | 2.3 | 4.8 | 2.3 | 2.5 | 1.7 | 3.4 |
| | | SD | 5.0 | 4.6 | 3.5 | 2.6 | 2.4 | 5.2 |
| Number of furniture | (8) | M | 1.9 | 5.2 | 1.5 | 2.3 | .9 | 2.1 |
| | | SD | 3.0 | 4.1 | 2.7 | 3.3 | 2.2 | 3.3 |
| Number of thicker walls | (9) | M | .6 | .3 | .2 | .5 | .5 | .3 |
| | | SD | .5 | .5 | .4 | .5 | .5 | .5 |
| Number of protruding structures | (10) | M | 1.2 | .5 | 1.2 | - | .5 | .3 |
| | | SD | 2.0 | 1.0 | 1.3 | - | 1.0 | 1.0 |
| Number of doorways | (11) | M | 3.1 | .1 | .3 | .3 | .4 | .4 |
| | | SD | .6 | .3 | .5 | .5 | .5 | .9 |
| Number of low walls | (12) | M | .19 | .5 | .3 | .3 | .4 | .4 |
| | | SD | .4 | .5 | .5 | .5 | .5 | .5 |
| Number of collapses | (13) | M | .3 | - | .1 | .1 | .1 | - |
| | | SD | .8 | - | .3 | .3 | .5 | - |
| Number of cars | (14) | M | 1.9 | 1.2 | .9 | .3 | .5 | .7 |
| | | SD | 1.7 | 1.5 | 1.1 | .6 | .9 | .8 |
| Number of accidents | (15) | M | .18 | .3 | .3 | .3 | .1 | .3 |
| | | SD | .8 | .6 | 1.0 | .6 | .4 | .5 |

Table 1. (continued)

Univarient Comparison of Age/Variable Interactions

With Which Play Materials Used

| | | | Younger | | Mid | | Older | |
|---|---|---|---|---|---|---|---|---|
| | | | Male | Female | Male | Female | Male | Female |
| Number of tragedies | (16) | M | .1 | .9 | 1.1 | .1 | .6 | 2.5 |
| | | SD | .5 | 2.7 | 2.1 | .4 | 1.2 | 7.8 |
| Number of channeled objects | (17) | M | .9 | 3.0 | .8 | .3 | .3 | .3 |
| | | SD | 1.6 | 6.9 | 1.0 | .5 | .6 | .6 |
| Number of chanreled objects/people arrested | (18) | M | - | .4 | .3 | .3 | .1 | .3 |
| | | SD | - | .7 | .9 | .5 | .3 | .6 |
| Height of construction | (19) | M | 10.9 | 11.1 | 17.5 | 7.5 | 9.6 | 10.6 |
| | | SD | 7.3 | 7.9 | 28.6 | 5.1 | 6.0 | 13.6 |
| Action or motion | (20) | M | 2.1 | 2.6 | 2.4 | 1.9 | 2.2 | 1.8 |
| | | SD | 1.2 | 1.1 | 1.0 | 1.1 | .9 | .8 |

Table 2.

Test of Significarce Using Wilks Lambda

Main effects/age

| Variable | F(1,84) | P | Groups Younger | Mid | Older |
|---|---|---|---|---|---|
| Number of cars | 7.80 | .001* | X | | |
| Number of furniture | 3.24 | .04 * | X | | |
| Number of channeled objects | 2.92 | .06 | | | |
| Number of animals | 2.60 | .08 | | | |
| Number of blocks | 1.72 | .19 | | | |
| Number of protruding structures | 1.10 | .37 | | | |
| Number of static figures | .96 | .39 | | | |
| Number of doorways | .91 | .41 | | | |
| Number of tragedies | .91 | .41 | | | |
| Action or motion | .88 | .42 | | | |
| Number of people | .85 | .43 | | | |
| Number of enclosed spaces | .77 | .45 | | | |
| Number of collapses | .56 | .57 | | | |
| Number of channeled objects/ people | .55 | .58 | | | |
| Number of figures inside the enclosure | .54 | .59 | | | |
| Number of thicker walls | .42 | .66 | | | |
| Number of intrusions | .40 | .67 | | | |
| Number of low walls | .34 | .72 | | | |
| Number of accidents | .31 | .73 | | | |
| Height of construction | .23 | .80 | | | |

*Significant at .05

Table 3.

Test of Significance Using Wilks Lambda

Main effects/sex

| Variable | F(1,84) | P | Male | Female |
|---|---|---|---|---|
| Number of blocks | 9.98 | <.002* | X | |
| Number of protruding structures | 7.78 | <.007* | X | |
| Number of furniture | 6.83 | <.011* | | X |
| Number of figures inside the enclosure | 2.95 | <.09 | | |
| Number of collapses | 2.76 | .10 | | |
| Number of cars | 2.29 | .13 | | |
| Number of enclosed spaces | 2.28 | .14 | | |
| Number of channelled objects/ people | 1.84 | .18 | | |
| Number of animals | 1.76 | .19 | | |
| Height of construction | .97 | .33 | | |
| Number of channelled objects | .78 | .38 | | |
| Number of doorways | .71 | .40 | | |
| Number of low walls | .65 | .42 | | |
| Number of tragedies | .63 | .43 | | |
| Number of people | .50 | .48 | | |
| Number of static figures | .48 | .49 | | |
| Number of thicker walls | .46 | .50 | | |
| Number of accidents | .39 | .59 | | |
| Action or motion | .27 | .61 | | |
| Number of intrusions | .08 | .784 | | |

* Significance at .05 level or better